

Patent Abstracts of Japan

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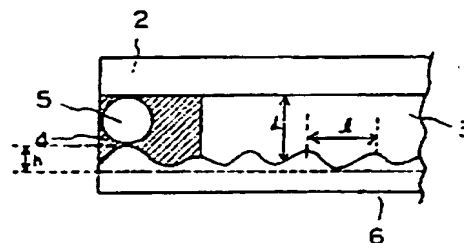
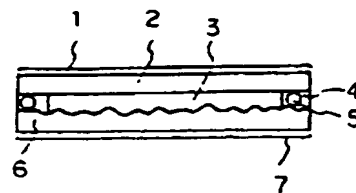
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APPLICATION NUMBER : 01033119

APPLICANT : SEIKO EPSON CORP;

INVENTOR : KUROIWA MASAHIRO;

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TITLE : LIQUID CRYSTAL SHUTTER



ABSTRACT : PURPOSE: To obtain a uniform contrast in a wide visual angle range by forming the surface of an electrode substrate on the side in contact with a liquid crystal layer to a rugged shape.

CONSTITUTION: The surface of the lower electrode substrate 6 of the upper electrode substrate 2 and the lower electrode substrate 6 of a liquid crystal cell on the side in contact with the liquid crystal layer 3 is provided with ruggedness by etching using hydrofluoric acid, etc., and an ITO film is formed thereon. The film is subjected to an orientation treatment. The height h is 0 to $5\mu\text{m}$ and the spacings l of the ruggedness array irregularly at 10 to $500\mu\text{m}$. The product $\Delta n \cdot d$ of the refractive index anisotropy Δn and cell thickness d of the liquid crystal, therefore, varies at the fine pitch of $l=10$ to $500\mu\text{m}$ and, therefore, the colors by the respective $\Delta n \cdot d$ are subtracted and the coloring of the panel is substantially invisible. The liquid crystal shutter having the uniform contrast within the wide visual angle range is eventually obtd.

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